306.8
Am3

AMERICAN
DYESTUFF REPORTER

LIBRARY
RECEIVED
JUL 5 - 1938
Department of Agriculture

DEVOTED TO THE INTERESTS OF TEXTILE CHEMISTRY
BLEACHING ♦ DYEING ♦ FINISHING ♦ PRINTING

VOLUME 27 JUNE 27, 1938 NUMBER 13

PONSOL*

GOLDEN ORANGE YL DOUBLE PASTE

PATENT APPLIED FOR

is the latest Du Pont anthraquinone vat dye possessing superior fastness to light and excellent fastness to laundering.

It yields yellowish shades of orange which change only slightly in tone when given the usual soaping finish. It reduces readily in alkaline hydrosulfite vats and also levels, penetrates and exhausts well. This product is applied in the same manner as other hot dyeing vat colors.

PONSOL GOLDEN ORANGE YL DOUBLE PASTE is recommended for dyeing all classes of cotton and rayon fabrics where the maximum resistance to light and laundering is desired. It may be applied in all types of dyeing apparatus and is particularly recommended for pigment pad work.

*REG. U.S. PAT. OFF.

E. I. DU PONT DE NEMOURS & CO., INC.

Organic Chemicals Department

DYESTUFFS DIVISION

Wilmington, Delaware, U. S. A.

DU PONT DYESTUFFS

OFFICIAL PUBLICATION OF THE AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

We are Specialists in Stainless Steel construction and are prepared to furnish all types of stainless steel equipment including the following:

Dyeing Machines — tubs of solid stainless steel or stainless steel lined... Dye Jiggs... Padders... Compartment Machines... Hosiery Dyeing Machines... Package Dyeing Machines... Skein Machines ...Raw Stock Machines—cylinders and linings... Drying Cylinders ... Tube Rolls... Immersion Rolls... Tenter Clamps — plates, inserts and controls. Also other equipment for special application.

●

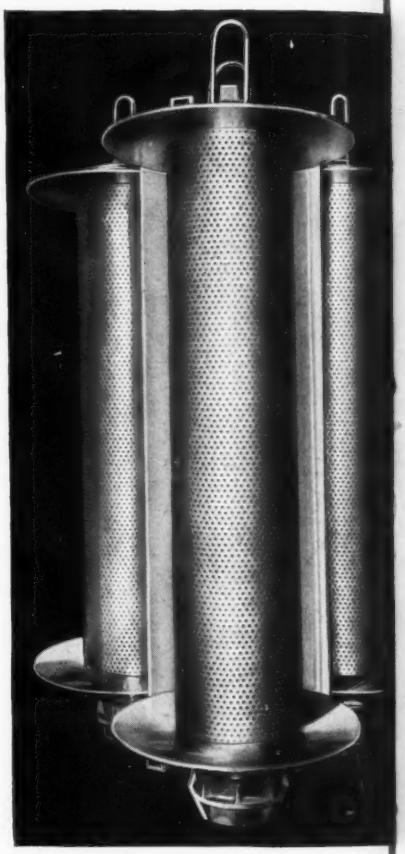
H. W. BUTTERWORTH & SONS CO.

PHILADELPHIA, PA.

Established 1820

PLANTS at PHILADELPHIA and BETHAYRES, PA.

New England Office:	Southern Office:	In Canada:
TURK'S HEAD BUILDING	JOHNSTON BUILDING	W. J. WESTAWAY CO.
Providence, R. I.	Charlotte, N. C.	Hamilton, Ontario



The machine in which this cluster of three extra large beams is dyed at one time is one of the largest stainless steel dyeing machines ever built.

The same type of machine is also used for the dyeing of yarn in package form and on warp beams.

BUTTERWORTH . . .

A Complete Line of Textile Finishing & Rayon Machinery

A. P. HOWES
Publisher

M. D. REESER
Advertising Manager

AMERICAN DYESTUFF REPORTER

LOUIS A. OLNEY
Directing Editor

NORMAN A. JOHNSON
Managing Editor

Copyrighted 1938 by Howes Publishing Co.

DEVOTED TO THE INTERESTS OF TEXTILE CHEMISTRY
• BLEACHING • DYEING • FINISHING • PRINTING •
AND THE NECESSARY MECHANICAL EQUIPMENT

"Circulated Everywhere Textiles Are Processed"

Subscription Price: $5.00 per year; Canadian, $6.00; Foreign, $6.00. Fifty cents per copy

VOLUME 27 | JUNE 27, 1938 | NUMBER 13

CONTENTS OF THIS ISSUE

Contents of previous issues can be found by consulting the Industrial Arts Index at your library

General

Some Notes on the Batching up of Piece Goods for Textile Printing 339
T. C. Hutchins

Technical Notes from Foreign Sources 354
Trade Notes—New Products 356
Open Forum 360

Proceedings of American Association of Textile Chemists and Colorists

Calendar of Coming Events P341
Textile Waste Disposal: An Orderly Approach to the Problem P342
L. L. Hedgepeth and C. B. Griffin, Jr.
Lacquer Printing in the Textile Industry P344
Ralph A. Nelson

The Fundamentals of Dyeing Rawstock Uniformly .. P346
L. E. Whittelsey
Vat Printing P349
Raymond W. Jacoby
Membership Applications P352

Editorials

Public Relations 353
Graduates 353

Better Times Seen 353

Official Publication of the American Association of Textile Chemists and Colorists

THE OBJECTS OF THIS ASSOCIATION ARE:

"To promote increase of knowledge of the application of dyes and chemicals in the Textile Industry.

"To encourage in any practicable way research work on chemical processes and materials of importance to the Textile Industry.

"To establish for the members channels by which the interchange of professional knowledge among them may be increased."

Published Every Other Monday

HOWES PUBLISHING CO. ~ ~ 440 FOURTH AVE. ~ ~ NEW YORK

CLOSING DATE FOR ADVERTISING COPY: MONDAY PRECEDING ISSUANCE DATE

National CARBANTHRENE Printing Powders

BRILLIANT • UNIFORM • FAST

The distinctive superiority of these instantly dispersable vat printing powders on Cotton, Rayon and Silk is demonstrated in Color Card No. 218. Your copy is available through our nearest branch.

NATIONAL ANILINE & CHEMICAL COMPANY, INC.
40 RECTOR STREET NEW YORK, N. Y.

BOSTON	150 Causeway St.	CHARLOTTE	201-203 W. First St.
PROVIDENCE	15 Westminster St.	GREENSBORO	Jefferson Standard Bldg.
CHICAGO	357 W. Erie St.	ATLANTA	140 Peachtree St.
PHILADELPHIA	200-204 S. Front St.	CHATTANOOGA	James Bldg.
SAN FRANCISCO	517 Howard St.	PORTLAND, ORE.	646 N. Thompson St.
	TORONTO	137-145 Wellington St., West	

Branches and Distributors throughout the World

National Dyes

AMERICAN
DYESTUFF REPORTER

VOLUME 27 JUNE 27, 1938 NUMBER 13

Some Notes on the Batching up of Piece-Goods for

Textile Printing

T. C. HUTCHINS

IN the preparation of goods for printing and dyeing the batching-up of the pieces in suitable runs is one of the minor operations which are necessary. The actual carrying out of the operation is simplicity itself, the goods being merely run from a loose pile over a few suitably placed spreader bars or tension rails and wound on to a beam at the delivery end of the machine, the whole being geared and driven as an unit. For the removal of loose lint, fluff, etc., it is also necessary to make use of brushes and beaters which are placed at suitable points in the structure. In many cases the goods are simply batched up as they are delivered from the end of the tenter frame where they are being widthed out in preparation for printing or dyeing, but for several reasons this arrangement is not always suitable. Where this is the case it is usual either to run the pieces off at the delivery end of the tenter plaited down in a loose pile or to allow them to be batched up and then re-batched at the batching or beaming machine as has been indicated.

It may seem a simple thing to batch goods in this way without running into any complications but the fact of the matter is that even in such a simple process it is possible to bring about results that are far from satisfactory in the later processes. In this as in other textile processes the manner of the performance of the operation is invariably reflected in the results obtained at further stages of the actual printing process. The great difficulty here is that the faults thus occasioned are not usually observable until the goods are actually into work on the printing machines, dye jiggers or other plant which may be involved.

Where nothing but one type of material is being dealt with, little or no trouble will be experienced but where one machine has to deal with a wide variety of materials, adjustments to meet the needs of each particular fabric will have to be made. To take an instance let it be supposed that for one run of prints the machine is required to batch up a very light cloth, e.g., that used for the production of handkerchiefs, and for the next run say a batch of heavy material like furniture coverings or casement fabric. In the first case a considerable amount of tension will be required in order to prevent the cloth from running on to the delivery beam too rapidly and thus giving rise to a loose or slack batch. On the other hand the next batch being made up of very much heavier material will not need so much tension by reason of its greater weight and consequently greater self-tension in its passage over the various rails etc. of the machine. The operator of the machine usually controls the tension by means of an expanding iron collar which closes or relaxes with the adjustment of a thumb-screw as the batch revolves. The collar is of course attached to a simple arrangement which revolves with the spindle carrying the batch, a flanged groove being provided in which the collar runs. This arrangement only holds good of course where the goods are being rebatched from the tenter-frame batches. If batching is being carried out from a loose plaited-down pile, extra tension will have to be supplied by means of additional rails. In this case also tension may be adjusted by means of a swivelling tension arrangement which consists of three rails through which the piece is threaded and the adjustment is made by swinging the rails backwards or forwards as the tension is required to be lessened or increased.

The amount of tension which may be put on the material differs very greatly according to the type of preparation to which the goods have originally been subjected, and of course according to the nature of the material itself. For instance it may be supposed that a smooth fabric will naturally offer less resistance to the tension rails etc., than a fabric of a rougher nature. So far as the actual preparation of the goods is concerned immediately before printing, the use of substances like glycerine to increase the penetrating powers of the colors, may have the result of retarding the cloth in its passage over the machine. This is more likely to happen when the goods have not been thoroughly dried out during the tentering operation, a very slight degree of humidity having a considerable effect in this connection. On the other hand the danger of having too little tension on the goods as they are being batched-up is more liable to cause trouble than the opposite fault. Indeed it may be noted that unless the degree of tension is so great

that it becomes difficult for the machine to be driven, it cannot be said to be too great. Generally speaking the more tightly a batch of cloth is wound on to the beams for printing the more satisfactory it will be from a printing point of view. This is obvious from the fact that in order to produce an accurate printing impression on the material it is absolutely necessary that it should pass through the machine under an amount of tension that will keep it free from creases or any tendency to shift in any direction during the passage through the nips of the engraved rollers.

Goods which are run too loosely during the batching operation give rise to all the troubles incidental to a "loose batch". One of these is "slack selvedges". A great deal of course depends upon the construction, in particular, of the selvedges. For instance in the case of a finishing fabric composed of a fifty-fifty mixture of viscose and cotton it is usual to construct the cloth with a cotton selvedge. If the warp is viscose and the weft cotton, shrinkage will take place in the direction of the warp and the selvedge will remain as it was. Under these circumstances it may readily be understood that unless sufficient tension is put upon the material during the tentering and batching operations prior to printing, this shrinkage will not be overcome and the selvedges will remain loose and baggy.

As a direct result of this loose condition of the selvedges frequent trouble may be encountered during the actual printing operation. The loose or baggy portions of the selvedges as they enter the nips of the printing machine are folded over and pressed one small fold upon another. As this portion of the fabric passes through the engraved roller nips the print paste is transferred only to the topmost fold and the part of the material immediately beneath receives no color at all. The final result of this is that when the goods are again straightened out over the drying cans or other drying apparatus, small unprinted crease marks show on every portion of the goods which has been so affected. The only way to avoid this trouble is to ensure that the goods prior to printing are thoroughly dry and tensioned to capacity so that the cotton selvedge is equally as taut as the rest of the material.

A further fault which has its origin in the same source and which may be cured in a similar manner is known as "bagging". If the batch is loose and not sufficiently tensioned as described it will be difficult on the printing machine to control the tensioning arrangements so that the material enters the machine under uniform conditions throughout the run. As the first nip of the machine receives the cloth from the batch the fabric is drawn off automatically under the tension thus exerted. As a result however of the loose state of the batch the cloth tends to be fed into the machine rather more quickly by the first nip than it can be taken up by the other nips running all at the same speed. In consequence of this a lag develops between the first and second nips of the machine, the ultimate result being that the printing impressions are jarred and distorted. This fault is very characteristic and may be seen at its worst in discharge styles. The main cause is as follows. It is obvious that the back-grey which acts as absorbent of surplus color will remain in the same condition of tension throughout, but on top of the grey comes the printed fabric which we have already concluded is in the form of a loose batch. When the lag takes place the printing impression is removed very slightly from its relative position in a lateral direction so that part of the unprinted material in the immediate vicinity of the original impression is brought into contact with the print paste from this impression, which has been transferred to the back-grey. The result is of course jarring and distortion in the manner described. The fault under discussion is more liable to take place when processing smooth surfaced fabrics e.g. viscose twills or taffetas. Fabrics of this description do not cling to the back-grey as it were and so are the more likely to shift under the conditions named. The same effect may be observed if the printed piece is under excessive tension in its passage through the printing machine. When the material leaves the last nip of the engraved rollers it is drawn over steam heated cylinders or over rollers etc. situated in a hot air drying arrangement. If the tension applied during this operation is greater than the tension applied to the back-grey as it also is drawn away from the rollers then the result will be that the printed piece, especially in the case of smooth fabrics, will tend to be drawn slightly in advance of the grey and so moved from its relative position as regards the printing impression. This brings about a fault which is similar in occurrence and appearance to what has already been described.

As has already been indicated the state of the selvedges during the batching operation has much to do with the condition of the goods as they arrive at the printing machine. The matter of shrinkage has often to be considered in this respect as was the case with the furnishing fabric previously cited. In that instance the trouble was loose or slack selvedges due to the lack of sufficient tension. In considering the problem from another point of view it is apparent that excessive tensioning may result in a reversal of the trouble and that as a result of too much tension it may be possible to have selvedges which are too tight. Here again the trouble is caused largely by the difference in the construction of the selvedges from the construction of the actual fabric. The selvedge being more closely woven of heavier yarns than the material, it does not stretch under the tension applied to the material during tentering and the result is a very tight selvedge with a tendency to turn in and cause creasing etc. during printing operations. Fortunately this type of fault can almost always be easily cured by altering the tensioning arrangements so that the fabric and the selvedge are not at variance with each other in this respect.

While on the subject of selvedges it may be well to mention the fact that often the successful turn-out of the finished goods depends to a large extent on the construction of this part of the fabric. To take the case of light materials e.g. are often used for the finer types of dress

(Continued on page 354)

PROCEEDINGS OF THE

American Association of Textile Chemists and Colorists

JUNE 27, 1938

Officers of the Association

ALBAN EAVENSON, *President*
Eavenson & Levering Co., Camden, N. J.

DUNCAN FERGUSON—ARTHUR R. THOMPSON, JR., *Vice-Presidents*

WILLIAM R. MOORHOUSE, *Treasurer*
National Aniline & Chemical Co., Bost. , Mass.

HAROLD C. CHAPIN, *Secretary*
Lowell Textile Institute, Lowell, Mass.

LOUIS A. OLNEY
President Emeritus and Chairman of the Research Committee
Lowell Textile Institute, Lowell, Mass.

Councilors-at-Large

BERKELEY L. HATHORNE — HAROLD M. CHASE
G. R. KREMERS — ARTHUR E. HIRST
WALTER M. SCOTT — HAROLD DE WITT SMITH

Councilors Representing Sections

REN VERITY (Rhode Island) — R. M. RITTER (Philadelphia)
HENRY F. HERRMANN (New York) — B. C. BLOWNEY, (Midwest)
DEXTER R. KNEELAND (N. New England) — HOMER WHELCHEL (South Central)
C. A. JONES (South Eastern) — THOMAS R. SMITH (Piedmont)

Local Sections and Their Officers

Northern New England Section

Clarence L. Nutting, Chairman, Arlington Mills, Lawrence, Mass.
John N. Dalton, Secretary, Pacific Mills, Worsted Division, Lawrence, Mass.

Rhode Island Section

Richard Haworth, Chairman, 25 Fountain St., Providence, R. I.
Louis D. Fleming, Secretary, Woodlawn Finishing Co., Pawtucket, R. I.

New York Section

Louis S. Zisman, Chairman, Gotham Silk Hosiery Co.
33rd St. and 1st Ave., New York, N. Y.
P. J. Kennedy, Secretary, E. I. duPont de Nemours & Co., Inc.
61 Thomas St., New York, N. Y.

Philadelphia Section

Herbert S. Travis, Chairman, Rohm & Haas Co., Inc., 222 West Washington Square, Philadelphia, Pa.
Paul L. Speakman, 203 Lore Ave., Hillcrest, Wilmington, Del.

Piedmont Section

Raphael E. Rupp, Chairman, Pacific Mills, Lyman, S. C.
J. W. Ivey, Secretary, Mathieson Alkali Works, Inc., Charlotte, N. C.

South Central Section

Nestor Groteluеschen, Chairman, Magnet Mills, Clinton, Tenn.
W. S. McNab, Secretary, Quaker City Chemical Co., Knoxville, Tenn.

Midwest Section

Edward J. Siegrist, Chairman, Holeproof Hosiery Co., Milwaukee, Wis.
Herbert W. Tetzlaff, Secretary, Geigy Co., Inc., Milwaukee, Wis.

South-Eastern Section

Robert W. Philip, Chairman, Editor, "Cotton," Atlanta, Ga.
Alfred R. Macormac, Secretary, Alabama Polytechnic Institute, Auburn, Ala.

Lowell Textile Institute Student Section

Herman T. Buckley, Chairman; Robert A. Lemieux, Secretary.

North Carolina State College Student Section

J. E. Spainhour, Chairman; J. A. Holder, Secretary.

Philadelphia Textile School Student Section

Wayne F. Fry, Chairman; Robert Roecker, Secretary

Members should notify the **Secretary** immediately of all address changes

CALENDAR OF COMING EVENTS

Outing, South Central Section, Lookout Mountain Hotel, August 5 and 6, 1938.

Meeting, Southeastern Section, Columbus, Ga., Sept. 10, 1938.

Annual Meeting and Convention, Atlanta Biltmore Hotel, Atlanta, Ga., December 2 and 3, 1938

Textile Waste Disposal

*An Orderly Approach to the Problem**

L. L. HEDGEPETH and C. B. GRIFFIN, JR**

WE have agreed that, if we were to select a text for the theme of our presentation to you this evening, it would be the sage observation on this problem by Geyer and Perry in their excellent report to the Textile Foundation, to wit:—

"The textile waste treatment problem is more complex than many other industrial waste purification problems because of the fact that no two textile wastes are alike in character, nor can any two wastes be purified by exactly the same treatment. The combined waste from each mill is different, and the waste from any one mill continually changes with the introduction of new processes or the change in market demand. Textile wastes are as varied in character as the kinds and colors of the goods produced within the mills. . . . Each problem must be studied carefully in order that its solution may conform to sound economic principles of conservation."

The subject of textile waste disposal is one of importance to this group and one that could not be fully covered in either 15 minutes or 15 hours. It is not the intent of this paper to call your attention to this problem for that already has been done, more forcibly in some states than in others. Some of these laws have teeth in them, too—even mentioning that "cease and desist" notices will be sent to those industrial plants whose effluent does not meet certain rigid specifications on specific dates. However, when we consider the fact that the textile industry is one of, if not the greatest contributor of industrial waste liquors to streams in this section, we do not have much room to grumble. After all, no one, not even a textile man, would like to catch fish of a beautiful hue composed of sulfur black, Blue 4R powder, and Conc. Green RB. We'd probably say that the shade was off or that there were hard water "resists" or that colors clashed, or perhaps say that the designer just had a bad day. Nor would a textile man like to sit under a shady tree by a small stream and observe wool-scouring wastes flowing by or smell their rare odors.

All laws considered, the textile industry is perhaps more fortunate than some others, for instance, chemical manufacturers, who in many cases have to contend not only with stream pollution but with atmospheric pollution as well.

It is well at this time that a careful approach to the problem be discussed. The disposal of waste liquors in a textile mill is usually a disagreeable topic for three distinct reasons:

1. No two textile wastes are alike in character, nor can any two wastes be handled in exactly the same manner. The combined waste from a mill changes in character almost hourly, and the waste from one department changes continually with changes in processing methods and new developments. In fact, the most consistent thing about textile wastes is the fact that they will consistently change.

2. The physical treatment and handling of textile waste liquors is far more difficult than the treatment of ordinary municipal sewage. Generally, it is more difficult to dispose of the sludge and very often hard and obnoxious problems come up. A good example of an obnoxious problem is as follows:

We know of a plant which formerly used a compound containing about 20 per cent cresylic acid in its yarn scouring operations. The yarn scouring waste liquors composed only a small percentage of its total volume of waste liquors, all of which were emptied into a fairly large river; yet a municipal water plant at least 25 miles downstream complained of bad tastes and odors due to chlorinated phenols when chlorine reacted with cresylic acid. The complaint was settled by changing the mill's yarn scouring formula to eliminate cresylic acid. Nothing else was needed in the way of pollution abatement.

3. A relatively small percentage of mills, either old established concerns or modern mills, have ever made up, as a separate justifiable budget item, an account for taking care of waste liquors. A large number of mill owners have for years looked upon any money or effort spent for disposal of waste liquors as an added overhead burden or investment from which no tangible return could ever be expected. This latter reason is probably the most disagreeable of the three mentioned and rightly so.

However, disagreeable or not, the problem still remains and it is one that cannot be handled in a hit or miss fashion. Many of you will be approached by persons with a story similar to this: "We have here a process. Build your disposal plant in accordance with these exact plans. Add so many grains of alum, or copperas, or phosphates, or activated carbon, or what have you per gallon. Then add so many parts per million chlorine. Mix, coagulate, settle, recirculate sludge and empty the effluent into the stream

*Given before Phila. Section, A.A.T.C.C., March 4, 1938.

**Technical Service Department, Pennsylvania Salt Manufacturing Co.

and pay us a small royalty. It will be perfectly safe, etc." The problem, gentlemen, is not as simple as that. This whole situation might be a relative Utopia if such were true. It is true that liquors from certain mills will be handled more easily than those from others and that in some few cases recognized sewage treatment methods may be applied, but for the most part the problem at each plant is an individual one which will require time and effort before the best and most economical treatment is established. If patent-medicine treatments are applied, the owner will wake up one fine day with an ache in the head and an even bigger ache in the pocket-book. He'll have a fine looking disposal plant on his hands which does nothing. The key to the situation is this: The textile man must not look upon the waste disposal problem from the viewpoint of a textile man, but he must completely orient himself to the viewpoint of a sewage man. We do not mean that the textile technician's experience, common sense, and sound business reasoning are to be discounted, but that waste treatment cannot be viewed in the same light as a proposed change in a bleaching or scouring procedure, or a change in weaving methods, or cloth construction. *The textile man to a degree must become a sewage man whether he likes it or not.* He must become accustomed to thinking in such terms as parts per million, b.o.d. (biochemical oxygen demand), grains per gallon, suspended solids, and forget completely such measurements as degrees Twaddell, and such terms as "sour," "handle," "chemic," and percentage by weight formulae. He must also forget about Special Oil KW-60, which is doing fine work in his dye bath, and Softener No. 22, which is working wonders on his Style No. 866 goods, and consider the lowly heavy chemicals, such as copperas, alum, lime, and phosphates, which not only fail to bear mysterious letters and lordly labels, but which generally may be purchased by the ton for less than the cost of 100 lb. of the average textile specialty. In other words, waste treatment requires that we come down to basic scientific facts and ways of thinking and that we avoid all rule of thumb methods and patent medicine or specialty cures.

The problem, therefore, becomes one which not only requires physical and chemical alterations, but one that makes mental readjustment almost a necessity.

We may outline an approach as follows:

1. Assume the mental attitude of a sewage treatment man who weighs his problems carefully against stream flow, upriver pollution, downriver use of stream, the added hazard of dangerous proximity to public water supply intakes, and other factors which added together determine the capacity of the stream to absorb the shock without creation of nuisance.

2. Study carefully the regulations of the stream pollution authority having jurisdiction and determine the degree of treatment to which the effluent of the plant must conform before it is released.

3. Consider thoroughly any changes in the present methods of plant operation which may ease the disposal problem. To emphasize the above we need ask only a few pertinent questions:

a. Can old dyeing machines be replaced with new type machines which require smaller volumes of dye liquor?

b. Will the application of counter-flow washing principles reduce the waste liquor volume sufficiently to make the installation an economical one?

c. Can certain dyestuffs, which aggravate the disposal problem, be avoided in favor of others which may be more easily handled?

d. Are the effluents from the last one or two washers of group connected in series sufficiently clean for re-use, or if they cannot be reused economically, are they sufficiently pure to be run directly into a stream rather than increasing the volume of liquor to be treated?

e. Can the frosted wool or the solvent method of wool scouring be substituted for the soap-soda ash method?

f. Will it be economical to recover caustic soda by dialysis or centrifuging and evaporation?

In other words, can the discharge of valuable chemicals into the stream be partly avoided by modernizing equipment and methods?

4. Determine carefully whether the waste liquors can be handled directly by the municipal sewage plant. Determine also whether the waste may be subjected to a treatment at the plant and then run into the municipal sewers. This method is generally the most satisfactory method of handling waste liquors, but it necessitates complete cooperation between mill and sewage plant. It may be necessary for the mill to construct holding tanks for its liquors and release definite volumes, at times agreed upon by the sewage plant management, and which have been partially treated to the degree requested.

5. If a disposal plant must be constructed for the mill, have the technical staff consult with competent authorities and set up a pilot plant for complete trials in order that the physical and chemical treatment of the waste may be worked out in the most economical and satisfactory manner. It is important that this be done before preparations of plans for the final plant, unless there is good reason to believe that previous experience with similar wastes justify basing plant design on experience gathered elsewhere, rather than in your own plant. Otherwise, much money and nervous energy will be dissipated with small return.

6. It is important, when large scale operation begins, that the disposal plant have competent management or it will become a problem child. The fact that a second hand or foreman knows the "art of finishing" or the "art of sizing" does not by any means indicate that he can properly supervise a waste disposal plant. We cannot stress too much the necessity of controlled operation for satisfactory results. Waste disposal under poor supervision can become another fly in the ointment, such as the recession,

C.I.O., or unfavorable trade treaties; but under careful, conscientious management, it can become another smooth-working department of which a mill may well be proud.

We once read in a British textile journal a statement somewhat to the effect that "more hearts and pocket-books have broken over textile waste problems than any other one activity in the British textile industry," and with this as a leading thought we conclude these remarks with the suggestion that each plant's problems be considered separately, and for waste disposal problems, to beware of the specialty product—its miracles helpeth you not. Sewage is real—it stinketh—it leaveth nothing to the imagination. Beware also of the proprietary or patented process, for like the mule, it is without pride of ancestry or hope of posterity.

The processes of sewage treatment are well established and understood—their good points proved—their limitations admitted; and in the words of Potter, "The search for a chemical that will completely deodorize, stabilize, and purify sewage belongs in the same category as the search for the Fountain of Youth."

—— ♦ ♦ ——

Lacquer Printing

in the Textile Industry*

RALPH A. NELSON**

A FEW years ago, the automobile industry had one of its most serious problems, and that was the painting of the cars. A material had to be found that would decrease the drying time of the finish in order to keep up with large scale, high speed production. Lacquers fulfilled this demand satisfactorily. Not only was the drying time decreased, but many new and desirable shades were obtained. Heretofore, the selection was limited primarily to dark shades.

Today, not only cars are finished with lacquers, but furniture, toys, delicate instruments, etc. Another important use for lacquers has been found in the textile printing industry, partially replacing the older methods of printing cloth. Lacquers are also used for printing on leather, rubber, cellophane, paper, and other such materials. Production can be increased, due to the fast drying qualities of the lacquer.

All lacquers are composed of cellulose cotton, nitrocellulose being the type most generally used for textiles. I have tried other types, such as acetate cellulose, ethyl cellulose and others, but nitrocellulose is very much superior in my opinion. The cotton is dissolved in an organic solvent, such as ethyl acetate, butyl acetate, etc., or mixtures of various organic solvents. After the cellulose has been thoroughly dissolved in the solvents, plasticizers are added. Castor oil is nearly a perfect plasticizer, because it assures flexibility of the film. Many other plasticizers are used.

You may produce a soft, mellow hand, suitable for silk satins, or a brisk hand for heavy crepes, by properly blending the plasticizers.

I do not think this can be done with regular gum colors very successfully. The mixing of the lacquers is very important, and those using lacquers will appreciate the fact. The oils or plasticizers mixed into the lacquers make a physical change. Therefore, in mixing the lacquers, the oils or plasticizers must be thoroughly dispersed in the lacquer before the coloring matter is added.

The coloring matter is another thing that is different from that used with regular gum colors, because very few dyestuffs can be used with lacquer. Many dyes have been tested and found not to be light fast. If a dye is not light fast, it has no value in dress goods, for instance. Therefore, pigments have been found to be more satisfactory than dyes; furthermore, not all pigments are satisfactory for it has been found that lake pigments are of little value, because they cause crocking. Pure pigments should be used to insure fastness of the print. The pigments used in lacquers are ground very carefully several times, and usually ground with an oil such as castor oil. When added to the lacquers, the oil in the grind serves as part of the plasticizer.

Lacquers can be formulated to any desired viscosity and still have the unique characteristic of softness or hardness, which is governed by the type and amount of plasticizer used. Lacquers can be made to dry instantly, if desired, and, on the other hand, the drying can be prolonged for weeks. The prolonged drying was accidently discovered when an overdose of octyl-acetate was used. The drying time can be very accurately varied. This means that if you have a pattern that has been engraved for satins, you may use the same engraving for crepes, merely by slowing the drying time of the lacquer. By the same token, if you have an engraving made for crepes, by thickening the lacquer, and using faster drying solvents,

*Presented at the March 25, 1938, meeting of the Rhode Island Section.

**Chemist, Velveray Corporation of America, Fall River, Mass.

the same engraving may be used for satins. Changing the drying time does not vary the flexibility of the lacquer.

The viscosity of nitrocellulose ranges from ¼ sec. visc. to 2,000 sec. visc. Since lacquers are colloidal solutions, you can easily visualize the various viscosities that can be produced, and at the same time controlling the percentage of cotton solids.

The type of equipment used in lacquer printing is somewhat similar to that used in regular printing, with the exception that no aftertreatment machinery is necessary. Once printed and out of the machine, the goods can be packed and shipped. However, it is desirable to allow a short time for drying,—this insures a perfect dried film of lacquer which has no odor. If lacquers are properly formulated, the goods will have no odor whatever when completely dry. When printing with regular gum colors, the goods have to be steamed, washed, run over drying cans and tenter frames, etc., after printing. The cost of operating this equipment is considerable.

In lacquer printing, it is simple to set up your machines; it takes very little time,—thirty-five changes on a single color print machine in one day is not unusual. A machine can be changed in less than fifteen minutes to another pattern and another color; the print rolls are cleaned on the machines with a lacquer wash. I would like to point out that men working on machines where lacquers are being used should take some precaution against the action of the solvents on their hands. There are several good materials on the market today for this purpose, and, if the men will use any one of these materials on their hands, they will experience no trouble.

Another thing in connection with lacquer printing is the fact the same back-grey is used as with regular printing, but, and this is important, after the back-grey has been used, it can be used over again with another color, without being washed. Lacquers going through on the back-grey dry so rapidly that the back-grey can be used again successfully without any trouble. It can be used over and over again until it is almost in rags. This is a tremendous saving.

We have printed many yards of white on crepes in fine lines and small woven effects, usually a white on a dark ground; the fabric is simply printed with a white lacquer, dried, and there is your print completed.

If a large motif is to be printed white on dark grounds, the motif is broken up into a series of lines which gives the effect of a solid when printed. Any pattern that has solids can be readily transferred into a line pattern in this manner. This is usually done for crepes.

The engraving is a very important item also. In the first place, you must have smooth engravings, especially for lines; for solid motifs, where you are printing on dark grounds, you run into a very different type of technique; the solids stand out, therefore, you have to use a high viscosity lacquer. With colors on light grounds, the situation changes again. Here you try to get on as little color as possible and still have a uniform coverage. The idea is to keep it from mottling and flushing.

When the goods come to us for lacquer printing, they come as finished goods. One of the problems we have is, to print on the many types of finishes which we receive. If the goods have too much finish in them, they may show a mottled effect when printed; this can be partly overcome by regulating the viscosity of the lacquer, since we cannot use strong lake pigments, and the other pigments which are not strong have very little power of coverage, we must use quite a little in the lacquer. The problem is this: here are large, medium and small objects on one roll; the small and medium objects present little difficulty. All you printers know the headache caused by the doctor blade digging out the engraving on large objects. (At this point, Mr. Nelson made a sketch on the blackboard.) It is done this way: the conventional ground for the large object may be a 60 ground, but by making only the outer part of the object a 60 ground, and the inner part, say, a 30 ground, and by regulating the viscosity of the lacquer, we eliminate this troublesome digging out, and end the headache.

When lacquer printing first started, there were only a very few qualities printed, such as satins and taffetas, but today, lacquers are printed on almost every type of fabric, both white on dark grounds and colors on light grounds, and still more recently, colors on dark grounds. There are several new types of fabrics on the market today, such as the rayons, acetates, and others, and the acetates are the ones which give the most trouble to the lacquer printers. The reason why we have trouble is because many of the lacquer solvents will dissolve the acetate fabrics. Therefore, each fabric must be tested in alcohol; if the dye bleeds, more coloring material should be added to the lacquer to overcome this bleeding.

Rayons are usually trouble-free as far as bleeding in the lacquers, but when goods have too much finish, a new problem develops; some finishes are very repellent to lacquers and cause the print to look mottled. It is sometimes necessary to button break goods of this type before lacquers can be printed on the fabric. If the finisher will regulate the amount of finish in the goods, this trouble will be completely eliminated.

Lacquers can be made up in any amount and stored for use as needed without spoiling; there is never any lacquer wasted due to spoilage.

Although lacquer printing has advanced very rapidly in the past few years, I believe that still great advancements will come when dyestuffs can be used in lacquers successfully.

The permanency of the print depends on the formulation of the lacquers. Lacquers can be formulated to withstand rigid washing and dry cleaning test very satisfactorily.

DISCUSSION

Q. Can you print more than one color at a time?

A. Yes, many colors can be printed at the same time. We do multicolor printing regularly.

Q. What about the hand of the goods?

A. Goods that have a mellow hand when we get them have the same mellow hand after we print them. Should the goods have a stiff hand when we get them, we break these goods and then print on the softened goods,—this will give the goods a better hand then when received.

Q. Why don't you do your own finishing?

A. It would take a lot of nerve for a man to go into the finishing business today. We believe that once the finisher understands the requirements for lacquer printing, he will finish the goods satisfactorily.

Q. What about the fire hazard?

A. The flash point of some of the lower boiling solvents are sometimes very low, and we have to be very careful to guard against static discharge, when using such solvents. A slight amount of moisture in the air helps to eliminate the static. Clean machines, placing waste rags in a metal container, and other simple precautions all help. We have several carbon dioxide portable tanks near all the print machines. Some lacquers can be formulated so that they will not burn.

Q. Don't the vapors from some of the solvents have a toxic action on your workers?

A. We do not use any highly toxic solvents. Adequate ventilation removes all the vapors, leaving the print room free from all harmful vapors.

The Fundamentals of Dyeing Rawstock Uniformly*

L. E. WHITTELSEY**

The essential requirements are—

(1) Properly maintained machinery. Correct machine load for particular stock and proper dyestuff combination.
(2) Suitable dyestuff combination for machine and stock.
(3) Stock that has been properly blended and opened.
(4) An efficient and trained drug mixer.
(5) A well equipped laboratory, managed by a trained dyer.

(1) Properly maintained machinery, correct machine load for particular stock and proper dyestuff combination.

THIS one statement really covers the essentials of uniform dyeing. First, let us take the machinery itself. The present type of packing machine has quite a few advantages over the older methods of stock dyeing. The first method was to put the loose cotton into an open tub and pole, until dyeing was complete. Next, we developed the mechanized version of the same principle. The open vat was retained, but a closed drum replaced the pole. The cotton was placed in this drum and turned through the liquor. Thus, we have our revolving kettles. These revolving kettles give us dyeings, which, viewed from a standpoint of uniformity, are unequalled by the present type machine. This process, however, gave the mill men a real cause for complaint. In the revolving process, the cotton became matted and twisted, giving what was generally referred to as "rat tails."

These "rat tails" could not be opened in the picking and consequently, a knotty or lumpy lap was the result, and it would naturally follow that good sliver could not be produced from a bad lap, and so on through the successive steps of drafting and twisting, however, the present method of dyeing or packing type machine is a reversal of the two former methods. In the first two, you see the cotton being worked in, or pulled through the liquor, but in the third step, the liquor is forced through the cotton. With this type dyeing, we do not obtain dyeings that are equal to the previous methods in levelness, so let's look into this briefly right here.

The machine makers have experimented with flow reversal and have found that this is not satisfactory because the cotton is disturbed and loosened in the machine, thereby, causing channels. So they have gone back to the one direction circulation, which tends to give heavier shades at the entrance of the liquor and weaker ones at the exit.

Of course, we can take these heavy and light shades, and, by blending, make a piece of yarn that will be close enough to the desired shade, but the next time we dye another

*Presented at meeting, Southeastern Section, April 23, 1938.
**Bibb Mfg. Co., Macon, Ga.

load, we have to go through this blending process all over again, and frequently have to add varying percentages of entirely foreign colors to bring this dyeing to the desired shade, but if we get uniform dyeings, we can dispense with all this additional work.

However, the advantages of this type machine are obvious to the mill men. We have no lumpy or knotty cotton to deal with, consequently, we are enabled to produce better laps from which to spin yarn.

Raw-stock dyeing was first developed for our direct type dyes, that of course means dyestuff which has an affinity for the cotton fibers just as they are without the assistance of any chemicals.

Let us consider the phenomena of dyeing and see what difference we can expect to get in the feel of the stock with the different type dyestuffs.

(First) The Direct Dyes

These dyes are soluble in water and have a direct affinity for the fiber, therefore, we can expect to have little change in the fiber.

(Second) The Sulfur Colors

These dyestuffs, being insoluble in water in their natural state, have to be reduced or changed to a soluble state. This is accomplished by adding hydrogen atoms, or a hydrogen compound, to the molecules of the dyestuffs. Here you see, we have a chemical change, whereas, in the direct dyeing, we only have a transposition of the dye from the water, to the cotton. When we have circulated this reduced dyestuff through the cotton, we then have to remove the hydrogen atoms, which were added to the dye molecule. This is what we call oxidation, another chemical change. Thus, we have subjected the fiber to more severe treatment, and therefore must expect more change in the fiber than in the less severe treatment, the direct dye.

(Third) The Vat Dyes

These dyes work on the same general principle as the sulfur dyes, but require a stronger reducing agent, and consequently, a stronger oxidation. Therefore, we must expect more difficulty in applying these. Also to be considered in the application of these reduced dyes, is the fact that the cotton itself will have some oxidizing effect on the dye solution, thereby causing uneven dyeing.

(Fourth) The Naphthol Dyes

In this method of coloring, we are manufacturing the dye, which is in this case, a pigment, and because of the fact that this is a definite pigment, we will have a harsher fiber to deal with in the operations that are to follow.

(Fifth) The Developed Dyes

These dyes are applied just as the direct dyes, but are developed or changed to another chemical compound. This, however, is not as severe a reaction as are the sulfur, vat, and naphthol reactions.

These type dyes were developed after the direct dyes were put into use and raw stock had gained a place in dye application and was in general demand. It was after this also when sulfur, vat, and naphthol dyes were put on the market from raw-stock dyeing. With the addition of these later type dyestuffs, the raw-stock dyers were called upon to apply these colors, and at the same time retain the soft handle and pliability of the fiber.

Now, the next thing to consider is the proper machine load for the particular stock. This is a very important factor in uniform dyeing. If we load too heavily, the liquor does not circulate properly, and the cotton is packed so that penetration is impossible; but if we do not load heavily enough, we have channels, and again, we can't possibly get uniform dyeings, therefore, we must consider the nature of the stock, and determine how lofty it may remain when subjected to the heat and pressure of the dyeing, or how compact this operation may make it become.

Likewise, the maintenance of these machines have a very definite effect on the shades produced. The pump must be kept in perfect condition to force the dye liquor through the cotton, and the valves must be kept tightened so as not to waste any of the dye, and of course the perforated plates must be kept open to allow free passage of the liquor.

To be considered along with the machine, are thermostatic controls. To get uniform dyeings, we must have uniform conditions and this is well nigh impossible when we have to depend entirely on human beings. As we all know, heat has a very pronounced effect on dyestuff.

We must also consider the finishing of the dyeing. Quite often we dyers feel that after the cotton comes out of the dye kettle our worries are over, and that extraction and drying are routine matters; but here we are overlooking the men who have to process this cotton after we turn it out. If we fail to wash out all traces of the chemicals we use, or leave excessive moisture in the fiber after extracting, we are inviting trouble, as these conditions will tend to harshen the fiber and impair its spinning qualities. We all know that the shortest lapse of time possible is the time it takes the boss carder to get from his room to the dye house when he gets some cotton that doesn't run well, so the raw-stock dyer should know something about the picking, carding, and spinning processes.

I don't mean to say that the dyer must tell the carder how to gauge his flats, or how to set the licker-in, but he should know enough about the machines to discuss their actions intelligently with the carder or spinner, as the case may be, and help him work out ways and means of overcoming the difficulties that arise from the dyeing of the stock.

As an illustration of this, let me cite one case of which I know. The carder reported that a certain lot of a color would not run on the cards. The dyer was called in to see the trouble, for which he was responsible. After watching the card run for a few minutes and noticing how the webb split and broke back and was attracted to the sides of the card, he made the suggestion that these laps be

taken out of the cards and allowed to stay in a place where there was plenty of humidity. This was done and the next morning, the cotton having regained its normal moisture, these laps were put back in the card and ran just as well as natural cotton.

Another instance where it paid a dyer to know something about the processing was the case of a fabric that appeared to be streaked in shade. The more the dyer looked at the streaks, the more he was convinced that this condition was not due to his dyeing. This piece of cloth was made of a mock warp of olive drab and white with an olive drab filling. Upon analyzing the cloth, the dyer found that the shade's appearance was due to uneven roving, which caused the white end of the mock to be heavier in some places, thereby giving an apparent light shade.

These two instances show that it pays the dyer to know the mill processes for personal and selfish reasons. This, however, is not the point that I want to emphasize. We should have utmost cooperation between all departments, instead of the carder and spinner laying their faulty work to the fact the cotton has been dyed, and therefore, there is nothing that can be done about it except curse the dyer.

(2) A suitable dyestuff combination for the stock and machine involved.

This is the most important part in obtaining uniform dyeings. We must select dyestuffs which have approximately the same capillary action, the same rates of exhaustion, and the same affinity for the cotton fiber, otherwise, we get dyeings that have several definite shades throughout the batch and we have to have our shades matched in the blending room.

We must also adopt our application formula to the stock and not the stock to one or two set rules of application. We usually try to put all direct dyes on by one set rule, and all of the other different types by a set rule, without ever considering the various stocks that the dye is to be put on. This must be considered if we are to obtain the best results on all types of stock and all dyestuffs.

For instance, on direct dyeings, we usually start the dyeing somewhere between cold and 140°, bring up to a boil, add the salt, and run 30 minutes, but quite often, we would do better to circulate longer at the lower temperatures, bring up more slowly, and add salt slowly. Likewise, it is sometimes advisable to use Glauber's salt rather than common salt. Now I know that you may say, why use a higher priced salt and take more time when we can get by with the variations in shade that we sometimes get? But here we are forgetting the fact that a uniform dyeing will give a deeper shade than the same amount of dyestuff that is not dyed uniformly. This statement can easily be proven by taking a blend, say 75 per cent black cotton and 25 per cent white cotton, and matching the depth on a straight, uniform dyeing. You would usually expect this to be around 70 per cent of your black formula, but the results will be surprising to those who care to make this test.

(3) Stock that has been well blended and opened.

This, too, is important in the uniform dyeing of the fiber. Stock that has been properly opened will dye more evenly, the extraction will be more complete, and consequently dyeing can be accomplished at a lower temperature, thus preserving spinning characteristics of the fiber.

(4) An efficient and trained drug mixer.

The drug room, you may say, is the heart of the dye house, because the accuracy of all dyeings depend on the drug room. The drug mixer should be familiar with the dyes that he compounds, so that he can determine at a glance whether or not a batch is properly dissolved or reduced, depending on the type color.

(5) A well equipped laboratory, managed by a trained dyer.

To continue the biological comparison, let us call the laboratory the lungs, because the laboratory must supply the heart or drug room with oxygen. Hence, you will see the absolute necessity of a trained, practical dyer in the laboratory.

The laboratory must produce dyeings which will check consistently on a production basis. The dyeings should always be made with as few dyes as is possible. I think 3 dyestuffs in a combination should be the maximum. While we are concerned with dyestuffs, let me say that I firmly believe that the dyestuff manufacturers have brought trouble on themselves by continuing to put on the market some of the older type dyes after they bring out new dyes which show better working qualities such as fastness and solubility and stability. Of course, I know that the dyer himself is responsible for this, because we don't like to change dyestuffs when we have a shade established and are getting along without much trouble. Therefore, we should have a laboratory manager, thoroughly familiar with the dyestuffs, who will always be on the alert to pick out the better working dyes and put them into use. He should also be qualified to pick out the good points of the various auxiliaries and assistants that are offered today, some of which, are like patent medicines, that is cure for all.

I have tried to point out that the fundamentals of uniform dyeing are very simple matters, but are matters which are based largely on the human element, and the fact that we have not spent enough time on developing our raw-stock machinery. Raw stock has had far less study and work than any other type of dyeing, and is really one that should have the most, because of the fact that we cannot use the assistants that are so well adapted to yarn and piece dyeing, because they will adversely affect the spinning of the fiber, and, too, we usually have a much larger amount of raw material in our batch than we do in the case of yarn.

The human element, of course, is taken into consideration on all type dyeing, but not to such an extent as raw stock. We must depend on this element for uniform packing and loading which can't possibly be as uniform day in and day out as machinery, which gives one density in all other type dyeings.

I have mentioned thermostatic controls. This is important for the raw-stock dyer, as it takes a vital part in the dye application away from the human lack of uniformity, and will definitely give a predetermined temperature in a set time, if so desired, and maintain the dye liquor at this set temperature. Let me again say that the fundamentals of uniform dyeing are:

1. Uniform stock.
2. Uniform packing and loading.
3. Uniform circulation.
4. Uniform preparation of the dyestuffs.
5. Uniform temperature controls.

Vat Printing*

RAYMOND W. JACOBY**

FROM information which was available, together with opinions obtained by discussing vat color costs, it was evident that a wide discrepancy existed in the application methods of vat color printing. A survey was undertaken to see what the situation was. This started in a small way, covering eight plants, and grew very rapidly, finally covering 33 print works in Canada, New England, the Central states and the South, engaged in all types of printing.

We obtained samples of printing pastes, together with their formulas. These pastes were cooked in the particular plants, so were just as were being used there. At first it was thought that they should be divided into two groups, cotton and rayon, as it seemed natural to assume that the simpler, less expensive formulas would be used on cotton, and the complicated and more expensive formulas used on rayon. This was not found to be the case in practice, however, so they were all grouped together and printed on five fabrics, plain cotton, mercerized cotton, spun rayon, filament rayon and pigmented rayon. Ten different vat colors were used, and any group of prints which was going to be compared was printed, aged and developed together. Most of the work was done in the laboratory, but checks were run in three plants which confirmed the laboratory results. It was understood, in collecting these samples and formulas, that the information was confidential, and it was so considered. We are not at liberty to discuss any particular case, but feel that a general discussion of the results is in order.

The general practice was to use two types of paste, a standard paste for use in standard color, usually 4 light, and a reduction paste for further reductions, although some plants had one paste which was used for all strengths of color.

When we obtained these prints, we found quite a wide range in color yield. Then we made a recapitulation of the formulas and studied the prints in conjunction with the formulas. This recapitulation showed a range far beyond anything we had anticipated. I will just read off a few of these figures to show how they vary:

Standard paste—	*Lbs. per Gallon*
Thickener varied from	0.74-3.34
Alkali varied from	0.80-2.00
Hydro varied from	0.67-2.14
Hygroscopic material varied from	0 -2.40
Reduction paste—	***Lbs. per Gallon***
Thickener varied from	0.74-3.10
Alkali varied from	0 -1.78
Hydro varied from	0 -1.24
Hygroscopic material varied from	0 -1.00
One paste for all strengths color—	***Lbs. per Gallon***
Thickener varied from	0.94-5.10
Alkali varied from	0.58-2.00
Hydro varied from	0.80-2.13
Hygroscopic material varied from	0 -1.25

There was a variation of almost 300 per cent on every item. The results varied not as greatly as that, but did vary a great deal.

Then we attempted to make deductions by comparing the prints with the formulas. There was no connection as far as chemical content was concerned. For instance, one paste had 1.0 lb. of hydro per gallon, another with 1.5 lbs. of hydro per gallon gave better results, but then one with 2.00 lbs. of hydro per gallon was worse than either. We went into it quite extensively, and one point did seem to run fairly consistent throughout, and that was that the color yield varied inversely to the amount of dry solids,—the more dry solids in the paste, the less color value. That seems more or less natural.

The thickeners most generally used are starches or converted starches. These are carbohydrates of the same

*Presented at the April 29, 1938, meeting of the Rhode Island Section.

**The Ciba Co.

chemical composition as cellulose, that is, rayon or cotton, so it is logical to assume that they should have an affinity for dyestuffs just the same as the fabrics on which they are being applied. We undertook to prove this point. We prepared six beakers with equal quantities of dyestuffs and chemicals: Into these we placed—

(1) 12 grams cotton
(2) 8 grams cotton
4 grams British gum
(3) 4 grams cotton
8 grams British gum
(4) 8 grams cotton
4 grams corn starch which had been cooked
(5) 4 grams cotton
8 grams corn starch which had been cooked
(6) 4 grams cotton.

In this way, each of the first five beakers contained 12 grams of carbohydrate, cotton, British gum and starch. They were all dyed together, and the skeins from the first five beakers were substantially the same shade, while the 4 gram skein from the sixth beaker was proportionately darker. This showed that if there were 12 grams of carbohydrate present, the color depth was the same, regardless of whether it was cotton, British gum or starch. (Here Mr. Jacoby showed skeins so dyed.)

Another point was that we felt the high solids content also affected the chemical content. We were at a loss how to prove it, that is, in any way as simple as the dyeing just described. In pastes with a high solids content, any attempt to reduce the chemical content caused loss in color value, but by reducing the thickener content, the alkali, hydro and hygroscopic agent could be materially reduced. This thickener content plays a vital part on the chemicals as well as on the color.

As far as price is concerned, there is just as wide a range in the costs of these printing pastes. The variation in cost is shown by the following figures:

Standard paste .....27.9c-77c per gal.
Reduction paste .....14c -54c per gal.
One paste .....25c -65c per gal.

It might be assumed that with high content standard pastes, simple reduction pastes might be used, which would offset that. That was not the case. We calculated some print pastes. For instance, in 8 light, the low cost was 21 cents and the high 59 cents; in 12 light, the low was 18.6 cents and the high 57.2 cents, which shows here again about a 300 per cent variation.

One very important point in the question of reduction is that the printing paste can never be cheaper than the reduction gum. A very low concentration of dyestuff yields little economy if reduction paste cost is high. (At this point, Mr. Jacoby showed some prints to illustrate this contention.) In some blotch work, the concentrations are very low. GCD Blue—140 light—cost of color 21 cents per gallon. This was made with a reduction paste costing 16 cents per gallon. Had there been 40 cents reduction paste cost, the color would cost that much more. With any given cost of reduction paste, it is easy to figure at what strength the cost of the paste is more than the cost of the color, so that further reductions result in very little reduction of cost, with, of course, the cost of the reduction paste as the ultimate limit. This is particularly evident in these prints where the colors are 140 light, 148 light, down to 400 light, and especially in blotch patterns like these where the output is from 35 to 55 yards per gallon of print paste. Jade Green—35 yards to the gallon, printed on a run in that pattern—16 cents for reduction gum and 2 cents for dyestuff. Had there been a 40-cent reduction gum, the increased cost would be about ¾ cent per yard, which, in the finishing business, is still some money.

Passing from the printing pastes to the colors themselves, we immediately come into the subject of colloids. When we start discussing colloids, we hear such terms as adsorption, cohesion, water envelope, ionic action, etc. I asked a last June graduate about colloids, and he said he was taught five different theories, but they were a very complicated subject. In recent years, there has been a decided effort to improve the vat color pastes. Various materials have been added in the dispersion of colors. All have extreme value. Most color manufacturers cannot foretell how a color is going to work with the wide variety of pastes used, but there is one common property of most of these materials. They are all materially affected by pH,—susceptible to high alkalinity. This may manifest itself in the form of specky color or cause the color to run badly. If you have one of these colors which acts badly, you can illustrate this by putting a few drops of that color paste on a glass and on the same glass put a few drops of alkali solution of the concentration used in print paste, then allow them to run together. You will see first a gentle shudder go through the color, then it will begin to huddle together. Finally, the whole mass will separate and have many groups of color particles. It is a case of having the color particles assembled into bunches like grapes, rather than separated like a lot of marbles. This condition is far from desirable for a printing paste and may result in specky color or poor running at the machine. This condition can generally be corrected afterwards by mechanical agitation, but it is much better to prevent it rather than to correct it. This can be done by holding out a small amount of glycerine and putting the color in that, or making up a paste the same content as a printing paste, but omitting the alkali, adding the color paste to it before adding to the main quantity of print paste. There is a time element involved in that as well. The action proceeds progressively. In other words, if a man makes up some paste in a tub, stirring in the color as he adds it, he gets a nice paste. Another man may dump in the printing paste and ladle in the color, then go looking around for a pair of gloves, or washes his dipper, and then proceeds to mix his paste, he

may not get good incorporation. Those two colors, while the ingredients are identical, will probably work entirely different in the machine. The time factor is very important in colors of that nature. Uniform methods should be established and followed in the making of color.

Assuming we have the proper formula and the most economical conditions, we come to a very vital part in the printing operation. You have all probably seen goods come up in the folding room with bars where the goods were stopped on the cans. This is an extreme case, but in all drying, that is going on more or less, due to a number of things, the most common of which is probably the decomposition of the hydro. Shading from end to end is sometimes caused by this. The best thing is to keep the temperature down to a minimum. You should take extreme care with your drying equipment. I recently had a complaint on discharge work with hot towers. That condition was improved by cutting down the temperature of the towers. Over-drying on cans has several bad effects. In the first place, by causing decomposition of the hydro, loss in color value results. Over-dried goods, if allowed to stand before ageing, hold their heat a long time, especially when standing in boxes. This is not only bad from the standpoint of destruction of the hydro, but affects the action in the ager. You all know the rapidity with which goods dried below their normal moisture content regain that moisture. If any of you have made moisture tests and attempted to weigh dried goods without closing them in a weighing tube, you have found that they will regain moisture faster than you can manipulate the weights.

This applies to over dried goods going into the ager. The goods tend to regain their normal moisture content. If this is done in the ager, they must get their moisture from the steam. When this is done, the steam is condensed to moisture and the latent heat of vaporization is liberated, which causes excessive heat in the ager, which, in turn, causes poor results. It is easy to demonstrate this. Take a roll of white cloth, without any print on it, overdry it by giving it a couple of runs on the cans, then run it through the ager, and you will find a very remarkable rise in temperature immediately, which is due to the latent heat of vaporization being liberated. It is better to prevent this rather than to correct it, and this can be done by not over-drying, but if that cannot be avoided, would recommend conditioning the goods with some type of moisture conditioning equipment before going into the ager.

In addition to this, the chemical reaction which takes place in the ager liberates heat, and excessive heat in an ager greatly affects the results. We have often found false economy in ager operation. In spite of the fact that many people simply know that steam comes out when you open a valve, it costs money to get it in back of that valve. In the desire to save expense, they have cut down the flow of steam to the ager. As above stated, a large amount of heat is generated within the ager, and the simplest way to remove this excess heat is to lead it away, which can be done by increasing the flow of steam through the ager. Here we have the paradox of reducing the temperature of the ager by increasing the flow of steam. It then becomes a problem of simple arithmetic as to whether the cost of the extra steam used is less than the saving in color. This is in line with most plant problems where economies in one direction can be obtained by increased costs in another, and one has to determine where the greatest benefits lie. A striking exception of this, however, is in the matter of print pastes, where lower costs of print pastes give greater color yields, so that there were savings on both ends.

Developing after ageing is controlled by the equipment at the different plants. This is very largely a matter of individual plant equipment. Various materials are used: water, peroxide, perborate, perborate and acid, chrome, chrome and acid, etc. With several colors, chrome and acid give decided dulling. There is no general rule to lay down. The brightest results are generally obtained with perborate. This is dangerous, due to slow rate of oxidation, and it is very liable to cause mark-offs. The brightest results are obtained in that way, however.

To summarize: The conditions actually in practice vary tremendously. Everybody is vitally interested in costs. These cost figures given above were obtained from practice. I might say that in order to make these costs comparative, we obtained the market prices for all materials, and used these in our work. Some companies had contracts for large quantities of materials, thereby getting the benefit of these prices. However, we used the same market prices on all materials for all the pastes, therefore, all our costs are comparative. We show here a tremendous variation in cost, which materially affects the operation of a plant.

The greatest variation in costs came in the matter of print paste and color yield, but there can also be considerable variation in the other factors, so that if one takes advantage of every opportunity for more economical operation, there is a wide field for effectiveness.

I am fully aware of the many uneconomical, unsound conditions which exist in the printing industry. I do not approve nor condone them. But in studying existing practice, one cannot fail to realize the wide discrepancies which exist in practice. It presents a striking other side to the picture. So, repeating the admission that many unsound situations exist, yet when someone approaches me and says, "So and so is doing a certain class of work for so much a yard, and it just can't be done"—I am reminded of the story of the man who called his lawyer and said, "I am in a terrible jam," and then went on to recount his misdeeds. When he had finished, the lawyer said assuringly, "Don't worry, old man, they can't put you in jail for that," to which he replied, "Oh! they can't, can't they? Well, let me tell you one thing. I am telephoning from the jail."

DISCUSSION

Q. What are the best thickening agents? The starches and dextrines which are most generally used?

A. The most largely used are the converted starches. Generally, corn, sometimes wheat or tapioca and unconverted starch. The converted starches are most generally used, however. I neglected to mention that the dyeing tests applied only to carbohydrates, starches or converted starches. We tried the same experiment with natural gums, where, as you know, viscous pastes can be obtained with low concentrations. These were found to materially impair color yield even with very low solid content and this may be due to some colloidal action.

Q. You mentioned in your discussion that you had a color printed with 1 lb. hydro per gallon, then you increased it to 1½ lbs. per gallon, and you got a better color.

A. What I meant to convey was that we took these pastes just as we received them. It happened that one paste had 1 lb. hydro, another 1½ lbs., and another 2 lbs. It is very likely, for instance, that the one with 2 lbs. had a very high solids content, and the 1 lb. a very low solids content. They were not uniform in other respects than the hydro content.

Q. With pastes of equal solids content and equal viscosity, what theory would you advance for difference in color value?

A. As I said, with dispersing agents, various colors will react differently. In these tests, we ran ten different colors. They did not run uniformly, due probably to the dispersing agents in the various colors.

Q. Would you expect the color value at one pressure to vary with the color value at another pressure?

A. The question of penetration is most likely to affect the color value. There are some types of printing pastes which will not stand excessive pressures. The greatest effect of pressure would be more color on the back of the cloth and less on the face.

Q. Any difference between potash and soda ash?

A. We found very little difference between potash and soda ash.

MEMBERSHIP APPLICATIONS

Active

Harry Henry Sims—Salesman-Demonstrator, Carolina Aniline & Extract Co., Charlotte, N. C. Sponsors: H. G. Miller, L. W. Sherrill.

Edward L. Schmidt—Overseer of Dyeing and Chemist, Lane Cotton Mills Co., New Orleans, La. Sponsors: W. F. Crayton, E. A. Feimster.

Joseph Platania—Colorist, 840 Brooklyn Ave., Brooklyn, N. Y. Sponsors: C. A. Funke, D. J. Graziano.

Anthony Marchett—Dyer, 338 West 38th St., Brooklyn, N. Y. Sponsors: W. B. Tucker, G. R. Decnyf.

Robert J. McCamy—Technical Sales, Southern Dyestuff Corporation, Charlotte, N. C. Sponsors: J. L. McEwen, J. L. Crist.

Ralph N. Mallard—Overseer of Dyeing, Bleaching and Polishing, The Linen Thread Co., Inc., Blue Mountain, Ala. Sponsors: C. B. Ordway, W. F. Crayton.

Associate

Howard A. Virkler—Salesman, W. F. Fancourt & Co., Burlington, N. C.

LAPEL BUTTONS

A new supply of lapel buttons in 10 Kt. gold, bearing the seal of the Association, is now ready. Orders from members in good standing, accompanied by price of $1.50, may be addressed to the Secretary of the Association, Lowell Textile Institute, Lowell, Mass. Please make checks payable to "Secretary, A.A.T.C.C."

AMERICAN
DYESTUFF
REPORTER

A. P. HOWES
Publisher

LOUIS A. OLNEY, Sc.D.
Professor of Chemistry and Dyeing, Lowell Textile Institute
Directing Editor

NORMAN A. JOHNSON
Managing Editor

MYRON DREW REESER
Advertising Manager

Published biweekly by
HOWES PUBLISHING CO., INC.
440 Fourth Avenue, New York City

Subscription price: $5.00 per year. Canadian, $6.00; foreign, $6.00.

Vol. 27 June 27, 1938 No. 13

PUBLIC RELATIONS

THE Calco Chemical Company is to be congratulated upon the piece of work it has done in promoting good relations with the public through its Open House which it held on May 14th and May 15th. A story of this event appears in the news pages of this issue.

As far as we know, this is the first time that a chemical plant has opened its doors to its neighbors in the surrounding community. Other plants have held open house for special groups but we have not heard of any other chemical plant that has invited the general public. According to Calco the event was a tremendous success as they received favorable comment in every local paper and in one paper which has been rather luke-warm to business in general appeared a very laudatory editorial. Everyone at Calco is unanimous in the opinion that it was one of the best public relations jobs that they could do, and it is their feeling, with which we are inclined to agree, that if more companies would open their doors and invite in the public, there would be a far better understanding of business throughout the country. It was noted that many employees took the opportunity to bring their families to visit the plant and pointed out, with pride, the building where they worked or the truck which they drove.

In a folder which was passed out, and in advertisements run in local newspapers at the time of the event, the one main point stressed was that Calco enters the daily life of its neighbors in the community, not only through color, but also through the wages that Calco pays and which eventually make their way to the local business men of the community.

In times like the present when business has not only to fight the depression, but also other prevailing forces, it would appear to us that improvement in public relations could well become a goal with every industrial plant in its own community. Such things will lead to a better understanding of business by the public at large. The "Open House" can become an important factor in this respect.

BETTER TIMES SEEN

ACCORDING to President Roosevelt, government figures on the actual national income for 1937 and the estimated national income for 1938 show that business is not as bad and has not been as bad as many people believe it to be. He said that the latest Department of Commerce estimates, based on the first quarter of 1938, indicated that this year's national income would be slightly more than $60,000,000,000 which figure is about $5,000,000,000 higher than the estimate which government agencies had been figuring on. This compares with last year's national income of $69,800,000,000, a lower figure than the $72,000,000,000 which had been anticipated.

It is the opinion of the President that the next few months will bring a decided upturn in business activity and employment, stressing the fact that the signing of the $3,753,000,000 relief bill would start several hundreds of millions of dollars flowing into trade channels within two months.

Regardless of the effect of the governmental spending program upon stimulating business there are slight indications of improvement in general business and it would appear that the bottom of the depression, if not actually reached, is being scraped.

GRADUATES

A NEW CROP of students has recently been graduated from the colleges and technical schools of the country and, as usual, they are looking for jobs. There is not much chance at present for them to be successful in their quest but apparently they are hopeful for the future.

An encouraging sign in this respect is seen in word from Lubbock, Texas, where it is reported that in maintaining a record established by the first graduating class of the textile engineering department of Texas Technological College, all nine of the 1938 June graduates have been placed in textile mills in the south.

As far as the textile industry is concerned there is a large number of graduates from the various textile schools raring to demonstrate their worth in the mill or laboratory. Although lacking in experience these students represent an opportunity to the textile chemical, dyestuff, textile manufacturing and textile testing industries to secure specifically educated graduates to become a part of their staffs.

It is true that there are a number of persons with wide experience in these fields who are also looking for opportunities and who are deserving of them but business cannot afford, in looking to the future, to ignore the current crop of graduates.

Textile Printing

(Continued from page 340)

materials and handkerchiefs. It will sometimes be the case that in order to meet competition some alteration will have to be made to the material. This often takes the form of constructing the fabric so that it will pull out to a predetermined finished width when extended to its utmost capacity. Possibly a cloth of this type will have been woven two inches narrowed in anticipation of this saving and the responsibility for making a good job of such goods is left to the printer. When the goods come to be printed the printer finds that there is no margin and in order to get the complete patterns on the material, in the case of handkerchief printing, he has to stretch the fabric beyond the capacity of the selvedge. The inevitable result is that under the influence of so much tension the selvedge often leaves the fabric and the last state is worse than the first. The batching-up or beaming machine as it is sometimes called serves other purpose besides the mere act of putting the goods up in suitable batches of so many pieces each. For instance one of its secondary functions is the removal of all loose fluff, lint etc. from the surface of the material. This operation is most important in the case of fabrics which are prone to be affected in this manner. Linens of all kinds need careful attention in this particular. If such loose and easily removable matter were allowed to adhere to the fabric it would become detached from the cloth as it passed through the printing machine and give rise to such printing faults as snappers or "snibs" as they are sometimes known. The cause of the occurrence of these faults is the raising of the doctor blade at one particular spot where a small piece of fluff etc. has fallen from the material into the color-box and from thence worked its way up via the color furnisher until it becomes lodged underneath the blade in such a way as to allow printing color to escape the cleaning action of the doctor edge at the point affected.

Damages of this kind can mount up to surprising figures during the year and in many cases trouble could easily enough be avoided by ensuring the thorough removal of all loose matter of the kind under discussion. The removal of all such extraneous matter is affected by passing the goods through a machine fitted with brushes and sometimes beaters in order to loosen all the adhering particles and then by means of a strong fan drawing all such particles away from the vicinity of the cloth so that they will not merely be brushed into the adjoining atmosphere and so be allowed to fall down upon the material again.

A further function of the beaming machine may be the correction of some small fault which has occurred during the tentering of the goods prior to printing. As an instance of this let us consider the case of handkerchief goods which require to be prepared for the printing machine with the threads absolutely straight. Suppose for the sake of argument that the goods were allowed to be printed in such a condition that the weft threads were slightly bowed or perhaps pulled in such a way that the weft develops a slight wave. It is apparent that when the goods come round again after all the printing processes to be finished there is going to be trouble. It is the finisher's job to send the goods out with the threads straight but if they have already been printed crooked, no amount of tentering is going to make matters right. The finisher's problem in such a predicament is difficult enough. If the goods are finished as he knows they ought to be, the threads will be straight but the printing as a result of the straightening of the threads, will be crooked. On the other hand if he endeavors to tenter the goods so that the print will appear straight then it is possible that trouble will arise over the crooked threads. The only hope is to strike a compromise and hope for the best.

So far as the present notes are concerned troubles of this kind can often be corrected by manipulation during the batching of the goods. For instance if the threads are bowed in the weft as a result of allowing the selvedges to lead during tentering, the fault can quite easily be corrected by beaming the goods over again (if they have been batched up at the delivery end of the tenter) with the tension on the weft in the opposite direction. The usual result is perfectly straight goods.

TECHNICAL NOTES FROM FOREIGN SOURCES

Physico-Chemical Investigations of Eulane New *Dr. Max Baudouin—Mell. Textil-Ber.* 17, 416 (1936). —A study of the exact conditions under which solutions of the above preparation are best taken up by the fiber. The paper is illustrated by three graphs, three tables, and three illustrations, two of them photographs, the others cross-sectional.

Pringsheim's Rule in Dyeing; Reactions in Gels *Dr. P. P. Sazanoff—Mell. Textil-Ber.* 17, 421 (1936). —A paper of theoretical interest. Three tables are included.

Homogeneity of Natural Cellulose and Its Derivatives *A. Sakostschikoff and D. Tumarkin—Mell. Textil-Ber.* 18, 522 (1937).—The third paper which the authors have published, upon the general topic of the total definite chemical composition of the natural cotton fiber.

Naturally, the cellulose content itself is not particularly aimed at in this study, cellulose being cellulose and in some ways fairly well understood (though from a few recently published statements even this may be questioned by some). It is rather the naturally and normally occurring "impurities" which the authors consider; and, in view of our large ignorance regarding their chemical nature, little beyond general designations can be given at present—

"pentosanes," "fats and waxes," etc. Indefinite as these terms are, however, such work as the present is slowly making it possible to trace these groups of substances down to smaller aggregates, with the hope and perhaps possibility of finally identifying the individual compounds in such groups.

Eleven numerical tables are included.

Replacement of Glycerine by Urea, etc., in Printing

Dr. Hans Gerber—Mell. Textil-Ber. 18, 327 (1937).—Glycerine has been used as a valuable component in printing pastes for many years. Its non-volatility and hygroscopicity keep a paste from drying out, and impart a softness and flexibility to the prints, even when a thickening agent which dries out hard and horny, such as gum arabic, and this present perhaps in considerable quantity, is used. The prints do not crock so badly as in some cases they will, if glycerine is not used; and in the case of some pigments glycerine seems to produce a better degree of dispersion of particle. There are also some advantages usually mentioned as due to a chemical action of glycerine, though perhaps the phenomena may be due rather to a physico-chemical effect. Some salts of the heavy metals, present in solution in the presence of glycerine, are not precipitated upon addition of alkali to complete the formula for the paste. It is, in fact, difficult to enumerate all the ways in which the presence of glycerine either confers, or assists in conferring, properties of advantage upon a printing paste.

Since the cost of glycerol is rising (this is written in Germany), and it is being, as far as possible, conserved for other purposes, efforts have been made to find some substitute for it in textile work. The glycols, which would first occur to one's mind, are too costly to use freely, and are, furthermore, lower in boiling-point, of different viscosity, etc. Work has therefore been done with urea and some of its derivatives, and with homologous compounds, as well as with hexamethylenetetramine, and with anhydrous phosphates, particularly sodium metaphosphate. It has been found that all of these compounds may replace glycerine more or less completely, according to the particular case, and work upon these lines is commended to the industry.

Fluorescent Indicators

Maurice Deribere—TIBA 15, 349 (1937).—The use of fluorescent indicators is no longer a novelty, though of comparatively brief standing. Its value lies chiefly in the certain results which it gives in the titration of cloudy or turbid solutions; but its value is by no means limited to such cases.

The question of hydrogen-ion concentration, according to the present phrase, is of course closely connected with the choice of indicator; the indicator will be one which will, at a certain pH value, alter in its fluorescence. If the indicator is a substance which at one concentration displays one fluorescence-color, this altering to a different color at a different point in the range, such an indicator is called a bifluorescent indicator. If, on the other hand, the indicator merely alters, at a certain point in the concentration-range, from fluorescent to non-fluorescent, or vice versa, it is called a monofluorescent indicator.

The technique is described. Several light-sources are mentioned—various U.V. lamps. Thirty-seven suitable indicators are tabulated, with a note as to the pH range, and the nature of the fluorescence of each.

One illustration is included.

Hydrogen Peroxide Stabilizers in Wool Bleaching

R. Folgner—Mell. Textil-Ber. 18, 619 (1937).—A carefully worked-up study of the details of the action of Igepon T as a stabilizer for hydrogen peroxide bleaching baths, in comparison with an olein alcohol sulfonation product. Five graphs and six tables are included.

The Iodine-Absorption of Mercerized Cotton

Garkenscha—Mell. Textil-Ber. 18, 622 (1937).—A study of the method of determining the degree of mercerization by the iodine method, in which an iodine solution weaker than usual is employed, and the use of solutions stronger than N/400 to N/500 is condemned. Seven tables and two graphs are included.

A short criticism of the paper, by Dr. K. Schwertassek, is appended (p. 626), including a graphic comparison of the sensitivities of the methods of Knecht, Schwalbe, Schwertassek, and Garkenscha. S. considers G.'s modification as useless.

The Sulfocyanide Wool-Crepe and Print-Effect Procedure

Dr. E. Justin-Mueller — Mell. Textil-Ber. 18, 628 (1937).—A paper half theoretical, half practical in nature. The subject cited is discussed, and a careful description of the methods in practice follows. The author considers that, as the process is carried out, the effect attained is due, when working in acid conditions, to the calcium thiocyanate, the active agent employed, breaking down into carbon oxysulfide and ammonia, while in the neutral or alkaline method the thiocyanate yields calcium sulfydrate (calcium sulfate is formed in the neutral case), and ammonia. The crepeing effect is due to alteration of the fiber by the reductive action of the sulfydrate.

With weaves of chlored wool, the fiber does not seem to be attacked; due apparently to the more resistant metakeratin formed in the chloring process.

By printing the goods with previously prepared sulfydrate, the effect is not so pronounced; the effect is not so sharply defined. The nascent sulfydrate is most effective, it being best produced by steaming the goods printed with a slightly alkaline calcium thiocyanate paste.

TRADE NOTES • NEW PRODUCTS

• MEETING, U.S.I.T.R.

The annual meeting of the U. S. Institute for Textile Research, adjourned from Nov. 12, 1937, was held at the Hotel Pennsylvania, New York City, on Tuesday, May 24th. Acting-President E. H. Killheffer spoke briefly of the reasons for adjournment and the principal business was the election of directors for a term to expire in 1940, and action upon a report of the committee on revision of the by-laws.

Directors elected were as follows: John Bancroft, Jr., John Bancroft & Sons Co., Wilmington, Del.; Earl Constantine, National Association of Hosiery Manufacturers, New York City; Philip A. Johnson, Jewett City, Conn.; D. H. Powers, Rohm & Haas Co., Inc., Philadelphia, Pa.; Robert E. Rose, E. I. duPont deNemours & Co., Inc., Wilmington, Del.; Harold deW. Smith, A. M. Tenney Associates, New York City; P. J. Wood, Royce Chemical Co., Carlton Hill, N. J.; Douglas G. Woolf, *Textile World*, New York City. Arthur Besse, National Association of Wool Manufacturers, New York, N. Y., was elected a director for a term expiring in 1939, succeeding G. E. Hopkins, resigned.

Following the meeting a luncheon was tendered by the institute in honor of Frank Nasmith, president, and J. R. Goodall, chairman of the diplomas committee, The Textile Institute, Manchester, England, at which function were guests representing many other textile associations.

A meeting of the board of directors was held, following the luncheon, for the election of officers and standing committees for the current year. The following were elected: President, Elvin H. Killheffer, E. I. duPont deNemours & Co., Inc.; Vice-presidents, Louis A. Olney, Lowell Textile Institute, and E. R. Schwarz, Massachusetts Institute of Technology; Secretary, Charles H. Clark; Treasurer, Ernest N. Hood, Old Colony Mfg. Corp., Chairman, Research Council, Warren E. Emley, National Bureau of Standards; Executive committee, John Bancroft, Jr., Alban Eavenson, Eavenson & Levering, Ernest N. Hood, Philip A. Johnson, Robert E. Rose, Edward R. Schwarz, Harold deW. Smith, the president *ex-officio* and the chairman of the research council *ex-officio*.

• FORTIETH COMMENCEMENT, L.T.I.

Degrees were received by 30 members of the class of 1938 at the Commencement exercises of Lowell Textile Institute which were held on June 7th in Southwick Hall. Four other members received diplomas and two graduate students were awarded masters' degrees.

Degrees and diplomas were awarded by President Charles H. Eames and the commencement address "Democracy at the Cross Roads" was delivered by Judge David A. Rose of the Dorchester (Mass.) Municipal Court.

Those who received the degree of bachelor of textile chemistry were: Russell D. Broadhurst, Middletown, Conn.; Hugh F. Carroll, Medford, Mass.; Nelson F. Getchell, Lowell, Mass.; Clinton Grossman, Providence, R. I.; Thomas W. Hardy, Lowell, Mass.; Winfield H. Howard, Chelmsford, Mass.; Samuel G. Kaplan, Lowell, Mass.; Robert A. Lemieux, Lowell, Mass.; Helmuth E. Lutz, Lowell, Mass.; Joseph H. Mahoney, Andover, Mass.; John P. Ploubides, Lowell, Mass.; Francis J. Qualey, Lowell, Mass.; Charles W. Reddish, Cincinnati, Ohio; Leo J. Sheehan, Dracut, Mass.; George D. Sood, Woonsocket, R. I.; George W. Wright, Jr., Newtonville, Mass.

The Louis A. Olney Book Prizes were awarded as follows: ten dollars to the student graduating from the chemistry and dyeing course who, not having already received recognition by appointment as an assistant instructor, shall have maintained the highest scholarship throughout the course, in the opinion of the instructing staff of the department;—to Winfield H. Howard; ten dollars and five dollars, respectively, to the students taking the regular textile chemistry and dyeing course who shall be considered as having attained the highest and second highest scholarship in second and first year chemistry; second year, first prize—to Arthur W. Lanner, North Tewksbury, Mass.; second prize—to Arthur S. Davis, Lowell, Mass.; first year, first prize, Sidney I. Saltsman, Lowell, Mass.; second prize—to George S. Urlaub, Queens Village, N. Y.

The order of the exercises was as follows: March, orchestra; Address of Welcome, President Charles H. Eames; Announcement of Medals and Awards; Selection, orchestra; Presentation of the Class Fence Ring, Kenneth R. Fox, President '38, and J. Lester Greene, President '39; Address "Democracy at the Crossroads," David A. Rose, Judge of Municipal Court, Dorchester, Mass.; Selection, orchestra; Presentation of Diplomas; Conferring of Degrees; Song, Alma Mater; March, orchestra.

CHEMISTRY GRADUATES AT LOWELL TEXTILE

Front row—Left to right: Leo J. Sheehan, Robert A. Lemieux, Helmuth E. Lutz, Thomas W. Hardy, Samuel G. Kaplan, John P. Ploubides.

Back row—Left to right: Clinton Grossman, George D. Sood, Nelson F. Getchell, Charles W. Reddish, Russell D. Broadhurst, Joseph H. Mahoney, Winfield H. Howard.

• CALCO'S OPEN HOUSE

As part of the 250th Anniversary Celebration of the founding of Somerset County, the Calco Chemical Co., Inc., Bound Brook, N. J., held an open house on May 14th and May 15th to which all persons over sixteen years of age were invited. Many groups from nearby high schools attended and there was a total attendance of over 2,000. Forty guides were kept busy all the time, taking groups around in parties of from ten to twelve. Calco's doors were opened to the public on May 14th from ten to four and on Sunday May 15th from two to four.

The guests were taken through the paper

laboratory, where paper was being made; the accounting department; research laboratories; medical department; the azo plant, where some Orange Y Extra Concentrated was made and used to dye wool—the whole procedure taking less than two minutes; the power house; the sulfuric acid plant; the shipping department and many other points of interest.

A feature of the open house was the display in the maintenance building where a number of booths had been erected to show how Calco and color enter into daily life. Included were exhibits showing "Calco in Sports", "Calco in the Living Room", "Calco in the Office", "Calco in the Kitchen", etc. There was also a booth entitled "Calco Goes to a Party" which featured a large birthday cake with colored frosting commemorating the 250th Anniversary. There was also an exhibit showing where Calco customers are located in this country. On display were shade cards, advertisements and mailing pieces. Another exhibit showed where Calco sells throughout the world.

A Ford automobile at the end of the exhibits showed the use of Calco Colors in an automobile.

From a point of view of improvement of relations with the public, the "Open House" was declared to be an unqualified success.

• CHEMICAL CONGRESS

Thirty-four nations represented by 2800 chemists among which were several Nobel Prize winners participated in the International Chemical Congress which opened in May in Rome, according to a report to the Department of Commerce by the office of the American Commercial Attache at Rome. American delegates to the Congress numbering 32 were headed by C. C. Concannon, Chairman of the American Delegation and Chief of the Commerce Department's Chemical Division.

Germany with 700 delegates from various academies and industrial laboratories was represented by the largest number of delegates. German chemists were scheduled to lecture on synthetic motor fuels, artificial lubricants, synthetic tanning materials, new varieties of paraffin, synthetic albumin, and topics in the field of biological chemistry, as well as several other important developments that have taken place during the four years which have elapsed since the last Congress.

The Congress was opened in the presence of the King of Italy, and the welcoming address was made by the Governor of Rome, who pointed out that this was the second time in 32 years that Rome had been the hostess to the International Congress.

Local observers did not expect any spectacular theses to be proclaimed at the Congress, but all the problems occupying the world of science at the present time were expected to be given consideration, according to the report.

• JOINS HERSTEIN

Walter A. Wisansky, having completed all the requirements for his Ph.D. Degress at Columbia University, has joined the staff of the Herstein Laboratories, Inc., 18 East 41st Street, New York City, as a research assistant.

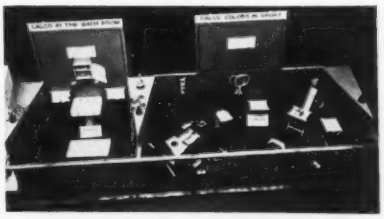
• SOMA OUTING

The Sulphonated Oil Manufacturers Association held its Spring Outing at Seaview Golf Club, Absecon, N. J., on June 1st and 2nd. Approximately forty members of the Association and their friends attended, most of them arriving by noon on Wednesday for a round of golf, followed by dinner and a well-rounded program of entertainment, including vocal and instrumental and a clever prestidigitator, that evening. The outing enjoyed two perfect days, much good golf was in evidence, and a spirit of good-fellowship prevailed.

On Thursday morning the championship round of golf was played and prizes were awarded at a party luncheon that afternoon. Winners in the golf tournament were as follows: Members' low net which carried with it the beautiful S.O.M.A. silver cup, won last year by A. E. Jones, Jr., was won by E. S. (Ted) Atkinson with a score of 87-15-72. Low net for members went to Fred Scholler with 85-12-73. Low net for visitors was won by C. V. Davis with 102-30-72. Other members winning prizes were John McChesney, A. E. Jones, Jr., L. O. Koons, A. J. Royce, J. C. Cadmus, Leon P. Brick, Chas. Ehrengart, and A. B. McCarty, and visitors sharing in the awards were K. M. Dillabaugh, M. J. McCarthy, E. A. Robison, T. H. Gill, Wm. Bertolet, A. Mittendorf, A. A. Underwood, Fred Babcock, G. E. Olsen, E. J. Healy, J. C. Kay and others.

At the final luncheon on Thursday, a vote of appreciation was extended to the Committee responsible for the success of the outing and particularly to its Chairman, Fred Scholler.

EXHIBITS AT CALCO'S OPEN HOUSE



● LEIPZIG FAIR

The 1980th Session of the Leipzig Trade Fair will be held from August 28th to September 1st, inclusive. It will comprise some 6,000 exhibits of the newest products of thirty-two countries. To accommodate the increased exhibits two large exhibition halls will be added to the forty-two buildings already in use. The entire space of several of the halls has already been engaged. An attendance of a quarter of a million exhibitors and buyers attracted from seventy-four countries is assured. Several important congresses of industrial leaders from many countries will be held in connection with the Fair which serves as a world clearing house for new ideas and products. The total turnover for the Spring Fair was $217,000,000.00, an increase of 10 per cent over 1937 and 262 per cent over 1933. The export sales totalled $70,000,000.00.

● DELEGATES WELCOMED

Through various associations the textile industry welcomed the delegates of the Textile Institute, Manchester, England—Frank Nasmith, president of the Institute, and J. R. S. Goodall, chairman of the diplomas committee.

The purpose of the British delegates' visit was to discuss with American members and others the possibility of a closer relationship between the organization in England and the industry here; to explore the possible extension of the Institute's degree of Textile Technologist to this country; and to exchange ideas on such matters of mutual interest as textile standardization, textile education, etc.

The initial event in honor of Messrs. Nasmith and Goodall was limited to American members of the Textile Institute. This was a luncheon at the Hotel St. Regis, New York, May 23, and was attended by the following members: Donald S. Ashbrook, of Zoch, Ashbrook & Co., Inc.; Prof. Herbert J. Ball, of Lowell Textile Institute; J. T. Broadbent, president of Standard Coated Products Corp.; William H. Cady, chief chemist of U. S. Finishing Co.; R. L. Chisholm, advertising manager of Universal Winding Co.; E. R. Clark, of U. S. Hoffman Machinery Corp.; D. E. Douty, general manager of U. S. Testing Co.; John B. Dickson, of A. G. Spalding & Bros.; Franklin W. Hobbs, president of Arlington Mills; Leonard S. Little, of Amalgamated Dyestuff & Chemical Works; James E. Magoffin, of University of North Carolina; B. Parsons, of Pepperell Mfg. Co.; John L. Parsons, of Hammermill Paper Co.; David C. Scott, of Henry L. Scott Co.; Harold DeWitt Smith and Ashton M. Tenney of A. M. Tenney Associates; E. O. Smith, vice-president of Universal Winding Co.; Douglas G. Woolf, editor of *Textile World*.

Dr. Harold DeWitt Smith was secretary of the provisional committee in charge of entertaining the delegates.

Another of the important events in honor of the visitors was the luncheon under the auspices of the U. S. Institute for Textile Research at the Hotel Pennsylvania, New York, May 24. The presidents of the various textile associations had been invited.

Other meetings which the delegates attended included dinner with the Board of Governors of the American Association of Textile Technologists, May 23; visit to the office of the American Standards Association, May 24; meeting with the officers of the Textile Division of the A. S. M. E. on the same day; visits to M. I. T. and to Lowell Textile Institute, May 26, followed by a conference with officers of Committee D-13 of the A. S. T. M.; dinner given by the Textile Society of Canada, in Montreal, May 27; a visit to Washington, May 31, which included contacts with the Bureau of Standards, the Textile Foundation, and the Department of Agriculture; luncheon with officers and council of the American Association of Textile Chemists and Colorists, June 1; and a visit to Charlotte, N. C., June 9, including luncheon given by Southern Combed Yarn Spinners Association.

● ANNUAL REUNION, L.T.I.

The 39th Annual Reunion of the Lowell Textile Institute Alumni Association was held on Saturday, June 4th, at the Institute in Lowell, Mass. The order of the program of events was as follows: 9:00 A.M., registration and social hour; 10-12:00 A. M., demonstration and explanation of new equipment and progress and inspection of the new Louis Pasteur Hall; 11:00 A. M., meeting of Lowell Textile Institute Alumni Athletic Association; 12:00 M., lunch in Assembly Hall; 1:00 P. M., Business Meeting; 2:30 P. M. Dedication of Campus Fence Section by the Class of '38; 3:00 P. M., Baseball Game: Lowell Textile vs. Alumni; 4-6:00 P. M., social hour at fraternity houses; 7:00 P. M., Dinner at Vesper Country Club.

One of the features of the day was the inspection of the Louis Pasteur Hall which is now under construction but which construction has advanced sufficiently far to give a good idea of the facilities which will be available for the use of the chemistry and dyeing department upon completion.

Out of 16 living members of the Class of '13, thirteen were present for their 25th reunion.

The following officers were elected at the business meeting: President, Russell T. Fisher, Secretary of the National Association of Cotton Manufacturers; Vice-president, Philip F. O'Brien, New York Textile High School; Secretary-treasurer, A. A. Stewart, Lowell Textile Institute; Assistant secretary, A. E. Wells, Lowell Textile Institute. Members of the executive committee will be: James F. Dewey, Queechee, Vt.; Roy H. Bradford, Andover, Mass.; Olin D. Gay, Cavendish, Vt.; Everett B. Rich, Wolfeboro, N. H.; Harry W. Martin, Watertown, Mass.; Homer C. Riggs, Lowell, Mass.; Brackett W. Parsons, Boston, Mass.; Milton Washburn, Boston, Mass.; Dean W. Symmes, Boston, Mass.; Alexander Campbell, Lawrence, Mass.; Thomas Joy, Boston, Mass.; Richard W. Rawlinson, Lowell, Mass.; Henry S. Sawyer, Dalton, Mass.; Parker F. Dunlap, Lowell, Mass.; Robert F. Jessen, Whitinsville, Mass. R. P. White of Lowell, Mass., was chairman of the nominating committee.

● MEETING, A.A.T.T.

A meeting of the American Association of Textile Technologists was held on June 1st at the Architectural League, New York City, at which 59 menbers and guests were present. William M. Grosvenor, Jr., chemical engineer and vice-president of the W. M. Grosvenor Laboratories, Inc., spoke on "Modern Methods in the Optical Examination of Textiles." More specifically he referred to the place of the microscope in textile technology and illustrated his talk with lantern slides of textile fibers made in different mountings.

A distinguished guest of the evening was J. R. S. Goodall, chairman of the diploma committee of the Textile Institute, Manchester, England.

Dr. J. F. X. Harold, president of the association, presided at the meeting which is the last of the present season. The next meeting will be held September 14th.

At the business meeting of members, Mr. Constant Scholer, director of the New York School of Textile Technology, was named chairman of a committee on unemployment.

● ROHM & HAAS RELEASE

Rohm & Haas Co., Inc., 222 West Washington Square, Philadelphia, Pa., announces release of a booklet of the following title:

Rhoplex Dispersions, Permanent Finishes for Textiles—which describes in detail these resinous finishes for textiles and shows the versatility and adaptability of these chemicals. These products repre-

sent a complete range of clear, colorless, synthetic resins for finishing all textile fibers and fabrics. The properties of these resins are described under the heading of specifications as follows: physical properties, effect on tensile strength, available grades, washing and dry-cleaning, organic solvents for RHoplexes, plasticizers for RHoplexes; the method of application is discussed as follows: preparation of mix, impregnation of fabric, fixation of the resin, addition of solvents, RHoplex dryer. There is also included in the booklet a table of RHoplex Dispersions and recommendations for the uses of the products in this series of compounds. This booklet should be of real interest to all textile processors.

● GENERAL RELEASES

General Dyestuff Corp., 435 Hudson Street, New York City, has recently distributed circulars describing the following products:

Rapidogen Bordeaux RN — which is more soluble and develops very much more quickly in acid steam than the old R brand. It produces on cotton and rayon heavy bordeaux prints said to be of good fastness to light and very good fastness to washing and chlorine. Circular I.G. 1493.

Medialan A, A pdr., AL—new synthetic milling and scouring agents. The A and AL are in paste form and the A Pdr. is supplied in powder form. It is claimed that, in comparison to soap, the Medialans have better resistance to hard water, low sensitivity to acids, excellent milling effect, do not split hydrolytically in aqueous solution, thereby enabling neutral scouring, and are very easily washed out. Corcular I.G. 1504.

Igepal W—a new synthetic scouring agent for the processing of wool and mixed fibers containing wool. It is claimed that it is very easily soluble, is resistant to hard water, possesses excellent wetting-out properties and protective effects toward the formation of lime soap, is considerably superior in scouring effects to the best soap, does not split hydrolytically in water and is very easily rinsed out. It is said to be of particular interest in that it can be utilized in acid scouring and acid milling. Circulars I.G. 1455 and I.G. 1456.

Fastusol Blue LFF2GL—a new homogeneous product which produces very bright shades on cotton and rayon said to be of excellent fastness to light. Circular I.G. 1514.

● GEIGY RELEASE

Geigy Company, Inc., 89 Barclay Street, New York City, announces release of a circular describing the following product:

Erio Anthracene Orange R L—a new, level dyeing acid color said to be of outstanding fastness to light. In addition, this color is said to be characterized by very good solubility and level dyeing properties, relatively good fastness to washing, good fastness to perspiration and very good fastness to light. It is stated that it can be used in both self and combination shades for the production of fashion shades for woolen knitting, weaving and carpet yarn (of good fastness to chlorine), hats, ladies' dress goods and cheap men's wear. It is further said to be suitable for dyeing unweighted silk. Circular 946.

● NATIONAL RELEASE

National Aniline & Chemical Co., Inc., 40 Rector Street, New York City, announces release of a booklet of the following title:

Nacconol N R — which describes the properties and applications of this all-purpose, surface active organic detergent. The first section of the book is given over to the discussion of surface active agents in general with specific references to Nacconol N R. It is stated herein that "Nacconol N R is not only an excellent general surface active agent but also has unusual detergent or cleaning properties and, due to low cost raw materials and large production, is exceptionally low in price. It is an all-purpose, surface active agent and organic detergent, which will facilitate processing costs."

A complete discussion of the properties of the product is given and its commercial applications are indicated. Under textile processing is presented uses of the product in regard to rayon and acetate rayon, wool, silk, cotton and miscellaneous applications. Textile processors should find this booklet of considerable value.

● CIBA RELEASES

The following circulars and sample cards have recently been issued by the Society of Chemical Industry in Basle, represented in the U. S. A. by the Ciba Co., Inc., and in Canada by the Ciba Co., Ltd.:

Acid Dyestuffs, Fashion Shades on Wool Yarn—this card shows 31 type colors, including Neolan Blue GG, also 118 combination shades, which have been selected from the season's most popular tones, made with the colors having the best levelling properties and best possible fastness to light. The fastness tables are opposite the dyeings of the type colors, so they may be referred to without turning a page. Sample Card No. 1520.

Dyeings on Mixed Wool and Viscose Fabrics—the card contains first 12 dyeings of solid shades made with the Half-wool and Polytex Colors, then 12 solid shades made with the Half-wool Fast and Polytex Fast Colors, finally 12 dyeings showing the viscose reserved, by the use of Acid and Neolan colors. Another series of shades shows two-color effects, where the wool has first been dyed with Acid and Neolan colors and the viscose later covered by using Chlorantine Fast Colors with the assistance of Albatex WS, to reserve the wool. Sample Card No. 1521.

Hosiery Shades on Wool-viscose and Half-wool plated knit goods — this card shows: 12 dyeings of the most important Half-wool Colors. 6 dyeings of the shading colors for wool. 6 dyeings of the shading colors for viscose. 24 fashion shades on wool-viscose (bright and delustered). 12 fashion shades on half-wool knit goods. The dyeings have been made by the half-wool one-bath method, whose practical details are described in full. Sample Card No. 1522.

Vat Printing Black GL, Micro Powder and Micro Paste—this type furnishes a deep black print said to be of very good fastness to light, washing and chlorine. The strength of the paste equals that of the powder. It is claimed that this new product has an advantage over the present vat printing blacks on the market in that it may be printed without any special process; it re-oxidizes quickly after ageing, so there is no danger of bleeding during washing. For cotton and rayon printing it is applied according to the usual methods. Sample Card No. 1527.

Cibanone Blue 2R, Cibanone Dark Blue MBA and Cibanone Black BAN double conc.—these colors are shown on materials woven in the grey and later subjected to kier boil and bleach. All three products are said to be especially adapted for resisting the action of kier boiling and bleaching, both with the regular chlorine bleach as well as the combined chlorine-peroxide method. However no specific guarantee can be given, on account of the diversity of materials and conditions that may be encountered; in every case it is advisable to make preliminary tests. The card contains complete details concerning the best suited dyeing processes. Sample Card No. 1536.

Polycete Fast Colors—the Polycete Fast Colors are adapted for dyeing:

Half-wool with Acetate Rayon.
Half-wool with Viscose and Acetate Rayon.
Half-silk with Acetate Rayon.
Half-silk with Viscose and Acetate Rayon.
Silk, Viscose and Acetate Rayon.
Silk, Wool, Viscose and Acetate Rayon.

in which cases the Polycete Fast Colors are said to excel in fastness to light. Light shades are dyed with 1% Ultravon W or 2% Albatex PO and 20-30% Glauber's Salt and for dark shades twice these amounts. Sample Card No. 1544.

Cibanaphtols and Bases on Cotton Yarn

—this card contains a larger number of Naphtols and Bases than former card No. 1000. Full details regarding affinities of the various products and the relations of baths is given, as well as the important fastness properties of various combinations. Sample Card No. 1550.

Chlorantine Fast Colors and other Direct Dyes fast to light on paper—the shades are shown in light and heavy dyeings and give a range of colors suited for fast color papers. Sample Card No. 1560.

Chlorantine Fast Green CLL patented—this dyestuff is shown on Cotton yarn, mercerized cotton, viscose and rayon yarn, bleached cotton goods, viscose rayon crepe, viscose cut staple, viscose rayon knit goods, Bemberg rayon, viscose delustered rayon knit goods, cotton-viscose goods, cotton-acetate goods, viscose-acetate delustered goods and Bemberg-acetate rayon goods. This new type is said to be distinguished for its fastness to light and resistance to the influence of calcareous water. The dyeings were made with the addition of Ultravon W or Albatex PO to the dyebath, thus improving the levelling and penetration and immensely adding to the softness of the finish. Sample Card No. 1581.

Cibanone Brilliant Green types — this card illustrates the following types:

Cibanone Brilliant Green BF Micro powder high concentration for dyeing, Micro powder conc. for dyeing, paste conc.

Cibanone Brilliant Green 2B Micro powder high conc. for dyeing, Micro powder conc. for dyeing.

Cibanone Brilliant Green 2G Micro powder high conc. for dyeing, Micro powder conc. for dyeing.

Cibanone Brilliant Green 4G Micro powder high conc. for dyeing, Micro powder conc. for dyeing. Sample Card No. 1590.

OPEN FORUM

Rules under which this department of the REPORTER is conducted are as follows:

1. Anyone who has a technical problem on which he would like advice may submit it to the Reporter and it will be published in the first available issue.

2. Any reader who feels that he has a solution of the problem may forward his reply to us and if we feel that the reply is suitable it will be published in a succeeding issue.

3. For each such reply published the Reporter will pay a minimum of $2.

4. In case there is more than one answer to the same question, the one covering the subject in the most complete and authentic manner will be published, or if two answers are sufficiently different both will be published. If two answers are considered equally good, the one first received will be given priority.

5. The Reporter will assume no responsibility whatsoever for the accuracy of the answers submitted—it is simply offering a vehicle for the public expression of its readers' opinions.

6. Both the questioner and answerer must send in his complete name and address. When requested we will publish only the initials or other identifying insignia.

45—At the present time there are sold in drug stores, department stores, etc., chemical preparations which are advertised as preventing runs, snags, breaks and spots in silk hosiery. I am very much interested in having complete information on these products—the chemicals used, the names of such products, the sources of articles that may have appeared on this subject in magazines or books, and where the chemicals used in such preparations may be purchased and at what price per pound.—**O.K.P.**

46—A discussion has arisen in our plant as to the actual physical causes of scroop on silk fibers. Is this effect visible under the microscope, and if not, what is the actual physical change between unscrooped and scrooped silk? Several theories have been evolved with regard to this, none of which seem to hold water, and I would appreciate it very much if some one could assist me in shedding some light on this subject.—**A.G.A.**

47—Please give remedy for skeins floating in vat dyeing of unmercerized cotton in machine, when 8 hour boil out has been given in a well designed box kier (pressure type kier not being available).—**W.S.G.**

CLASSIFIED

The rate for "Position Wanted" advertisements in this column is 2 cents a word—with a minimum of 50 cents per insertion. For all other types of advertisements—i.e., help wanted, machinery or supplies for sale—the rate is $5.00 per column inch or less per insertion.

POSITION WANTED: Finishing plant chemist desires responsible position. Expert on vats, napthols and other cotton and rayon dyeing. All types of control work and testing. 26 years' experience on yarn and piece goods. Write Box No. 993, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

POSITION WANTED:—Experienced Dyestuff Salesman and Demonstrator now employed wishes to make change. Understands all types dyestuff including Naphthols. Would consider taking charge dye house or lab. New England preferred but would go anywhere. Write Box No. 128, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

POSITION WANTED:—Ten years experience in dyestuff laboratory. Experienced with all types of colors and materials. Pratt graduate. Age 29; single. Write Box No. 129, American Dyestuff Reporter, 440 Fourth Ave., New York, New York.

POSITION WANTED:—Recent graduate of the College of the City of New York (B. S. in Chemistry) seeks opportunity in textile laboratory in return for loyalty and efficient service. Write Box No. 130, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

POSITION WANTED:—By recent graduate of New Bedford Textile School's three year course in chemistry, dyeing and finishing. Wants opportunity to demonstrate efficiency. Some synthetic resin knowledge. Will go anywhere. Write Box No. 131, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.